

Claims

- 1 1. A suturing instrument comprising:
 - 2 an elongate body member;
 - 3 a needle deployment system disposed at a distal portion of the elongate body member, the
 - 4 needle deployment system comprising a forward-deploying needle carrier; and
 - 5 a catch disposed on the elongate body member to receive and retain the needle.
- 1 2. A suturing instrument as defined in claim 1, further comprising a deployment controller
- 2 having a distal end, the deployment controller extending substantially along a longitudinal axis
- 3 of the elongate body member to the distal portion of the elongate body member where the distal
- 4 end of the deployment controller being coupled to the needle carrier to facilitate movement of
- 5 the needle carrier between a retracted position and a deployed position.
- 1 3. A suturing instrument as defined in claim 2, further comprising an actuator coupled to a
- 2 proximal end of the deployment controller.
- 1 4. A suturing instrument as defined in claim 2, wherein the deployment controller is
- 2 configured to guide the needle carrier along a path that comprises a proximal curved path
- 3 segment leading initially away from the elongate body member and then towards the elongate
- 4 body member.
- 1 5. A suturing instrument as defined in claim 1, further comprising a second needle carrier.
- 1 6. A suturing instrument as defined in claim 1, further comprising a suture with an attached
- 2 needle.
- 1 7. A suturing instrument as defined in claim 6, wherein the needle inserts into the needle
- 2 carrier..
- 1 8. A suturing instrument as defined in claim 1, wherein the catch is positioned on the
- 2 elongate body member such that a distal path segment of the needle carrier's path is intercepted
- 3 by the catch.

1 9. A suturing instrument as defined in claim 2, further comprising a flexible drive member
2 coupling the deployment controller to the needle carrier

1 10. A suturing instrument as defined in claim 9, wherein the flexible driver member
2 comprises an alloy including nickel and titanium.

1 11. A suturing instrument as defined in claim 1, wherein the needle carrier and needle catch
2 are located in a distal tip assembly coupled to the elongate body member such that the distal tip
3 assembly is free to rotate axially about a longitudinal axis with respect to the elongate body
4 member.

1 12. A suturing instrument as defined in claim 1, wherein the needle carrier and needle catch
2 are located in a distal tip assembly coupled to the elongate body member at a pivot joint such that
3 the distal tip assembly is free to deflect about the pivot joint.

13. A method for placing a suture in tissue comprising the steps of:

1 placing a suturing instrument enclosing a forward-deploying needle carrier including a
2 needle, wherein the forward-deploying needle carrier is movably positioned within a needle
3 carrier channel adjacent the tissue to be sutured;

4 deploying the forward-deploying needle carrier out of the suturing instrument through a
5 forward-directed exit port; and

6 capturing the needle carried by the forward-deploying needle carrier in a catch that
7 receives and retains the needle.

1 14. The method of claim 13, wherein deploying the forward-deploying needle carrier out of
2 the suturing instrument through a forward-directed exit port comprises activating a deployment
3 controller, the deployment controller having a distal end and extending substantially along a
4 longitudinal axis of an elongate body member to the distal portion of the elongate body member,
5 the distal end of the deployment controller being coupled to the needle carrier to facilitate
6 movement of the needle carrier between a retracted position and a deployed position.

1 15. The method of claim 14, wherein deploying the forward-deploying needle carrier out of
2 the suturing instrument through a forward-directed exit port comprises activating an actuator
3 coupled to a proximal end of the deployment controller.

1 16. The method of claim 14, wherein deploying the forward-deploying needle carrier out of
2 the suturing instrument through a forward-directed exit port comprises activating the deployment
3 controller, the deployment controller being configured to guide the needle carrier along a path
4 that includes a proximal curved path segment leading initially away from the elongate body
5 member and then toward the elongate body member.

1 17. The method of claim 13, further comprising placing a suturing instrument enclosing a
2 second forward-deploying needle carrier including a needle, wherein the second forward-
3 deploying needle carrier is movably positioned within a needle carrier channel adjacent the tissue
4 to be sutured.

1 18. The method of claim 13, wherein placing a suturing instrument enclosing a forward-
2 deploying needle carrier further comprises associating a suture with said needle.

1 19. The method of claim 13, wherein the needle carrier follows a path including a distal path
2 segment, the needle being intercepted by the catch as the needle carrier traverses the distal path
3 segment.

1 20. A method for shortening the pelvic floor comprising the steps of:
2 placing a suturing instrument enclosing a forward-deploying needle carrier including a
3 needle adjacent to the tissue of the pelvic floor;
4 deploying the suturing instrument such that the suture is passed through the tissue of the
5 pelvic floor; and
6 tightening the suture such that the pelvic floor buckles and is effectively shortened in height.

1 21. The method of claim 20, further comprising a second deploying of the suturing
2 instrument such that the suture is passed through the tissue of the pelvic floor prior to tightening
3 the suture such that the pelvic floor buckles and is effectively shortened in height.

1 22. The method of claim 20, wherein the suturing instrument comprises:
2 an elongate body member;
3 a needle deployment system disposed at a distal portion of the elongate body member, the
4 needle deployment system comprising the forward-deploying needle carrier; and
5 a catch disposed on the elongate body member to receive and retain the needle.

1 23. The method of claim 22, wherein the suturing instrument further comprises:
2 a deployment controller having a distal end, the deployment controller extending
3 substantially along a longitudinal axis of the elongate body member to the distal portion of the
4 elongate body member, the distal end of the deployment controller being coupled to the needle
5 carrier to facilitate movement of the needle carrier between a retracted position and a deployed
6 position.